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FIG. 1

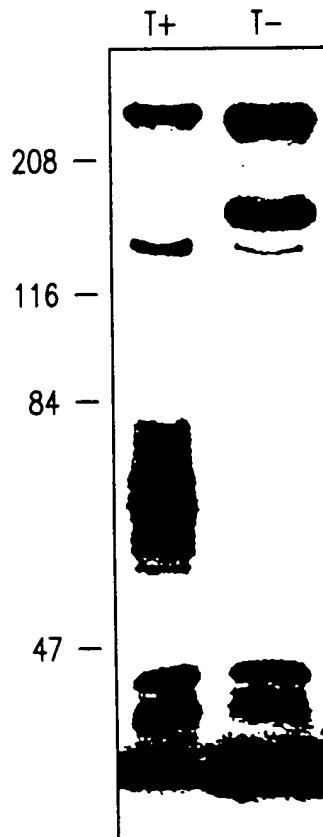
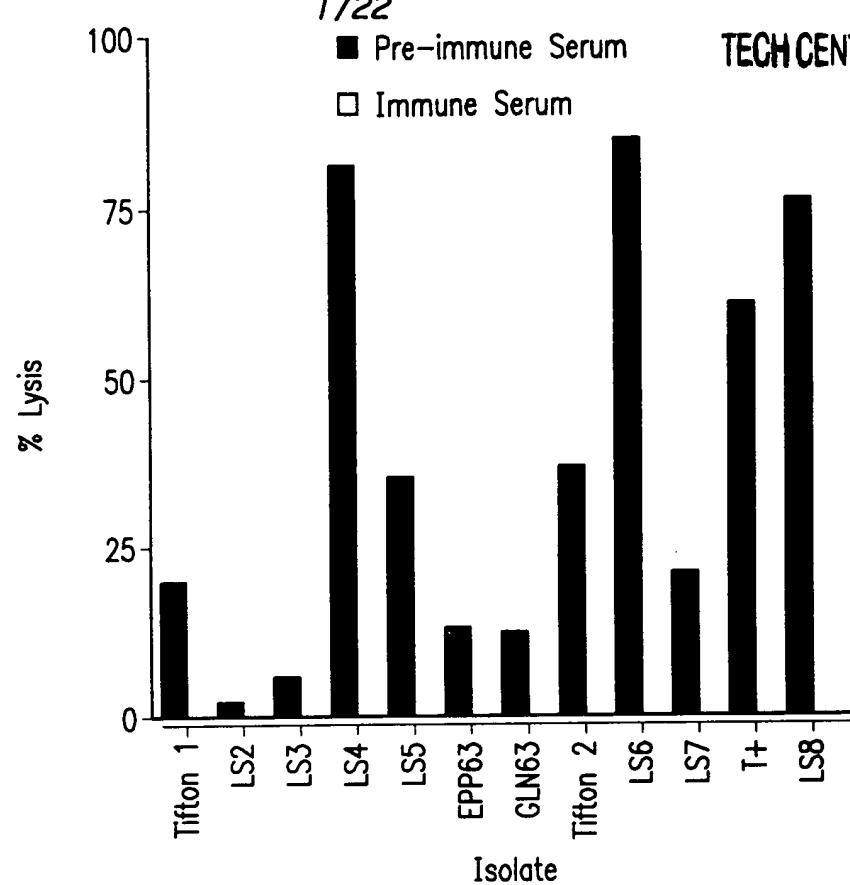
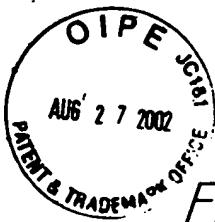


FIG. 2

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FIG. 3-1

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1 ATGTCCAATATAAATGTAATTAATCTAATATTCAAGCAGGCTTGAATTCAACAAAGTCT 60  
1 M S N I N V I K S N I Q A G L N S T K S 20  
  
61 GGATTAAGGAAATCTTACTTGGCTATTCCAAAGATTATGATCGCAAAAGGTGGACT 120  
21 G L K N L Y L A I P K D Y S D P Q K G G T 40  
  
121 TTAAATGATTTATTAAAGCTGCTGATGAAATTAGGTATTCTGGTTAGCAGAAGAGCCT 180  
41 L N D F E K A A D E L G I A R L A E E P 60  
  
181 AATCACACTGAAACAGCAAAAAAATCTGTTGACACAGTAAATCAGTTCTCTCTCAC 240  
61 N H T E T A K K S V D T V N Q F L S L T 80  
  
241 CAAACTGGTATTGCTATTCGCAACAAAATTAGAAAAGTTCTTACAAAACATTCTACC 300  
81 Q T G I A I S A T K L E K F L Q K H S T 100  
  
301 AATAAGTTAGCCAAAGGGTTAGACAGTGTAGAAATATTGATCGTAAATTAGGTAAAGCA 360  
101 N K L A K G L D S V E N I D R K L G K A 120  
  
361 AGTAATGTATTATCACATTAAGCTTTGGGACTGCATTAGCGGGTATAGAACTT 420  
121 S N V L S T L S S F L G T A L A G I E L 140  
  
421 GATTCTTAATCAAAAAGGTGATGCTGCACCTGATGCTTGGCTAAAGCTAGTATTGAC 480  
141 D S L I K K G D A A P D A L A K A S I D 160  
  
481 TTGATTAATGAGATAATTGTAATCTATCTAGAGTACTCAAACGATTGAAGCATTCT 540  
161 L I N E I I G N L S Q S T Q T I E A F S 180  
  
541 TCACAGTTAGCAAAGTTAGGTTACTATATCGCAGGCTAAAGGCTCTAATATAGGA 600  
181 S Q L A K L G S T I S Q A K G F S N I G 200  
  
601 AACAGTTGCAAAACTAAATTTCTAAACAAATCTGGTTGGAAATAATTACTGGT 660  
201 N K L Q N L N S S K T N L G L E I I T G 220  
  
661 TTGCTATCAGGCATTCTGCAGGCTTGCAGGCTTGCAGGATAAAATGCATCGACTGGCAA 720  
221 L L S G I S A G F A L A D K N A S T G K 240  
  
721 AAAGTTGCTGCAGGTTTGAATTAAGCAATCAAGTTATGGTAATGTAACAAAGCAATT 780  
241 K V A A G F E L S N Q V I G N V T K A I 260  
  
781 TCTTCATATGTTAGCACAACGTGTTGCTGGTCTATCAACTACTGGTGTGTTGCT 840  
261 S S Y V L A Q R V A A G L S T T G A V A 280  
  
841 GCTTAATTACTCATCGATTATGTTGGCAATTAGTCCTTGGCATTATGAATGCAGCA 900  
281 A L I T S S I M L A I S P L A F M N A A 300  
  
901 GATAAATTCAATCATGCTAATGCTCTTGTGAGTTGCAAAACAATTCCGAAAATTGGC 960  
301 D K F N H A N A L D E F A K Q F R K F G 320



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FIG. 3-2

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961 TATGATGGGATCATTATTGGCTGAATATCAGCGTGGTGGTACTATTGAAGCTTCA 1020  
321 Y D G D H L L A E Y Q R G V G T I E A S 340

1021 TTAACTACAATTAGTACGGCATTAGGTGCAGTTCTGCTGGTGT, TCCGCTGCTGCTGTA 1080  
341 L T T I S T A L G A V S A G V S V A A V 360

1081 GGATCTGCTGTTGGTGCACCGATTGCACTATTAGTTGCAGGTGTTACAGGATTGATCTCT 1140  
361 G S A V G A P I A L L V A G V T G L I S 380

1141 GGAATTTAGAAGCGTCTAACACAGGCAATGTTGAAAGTGTGCTAACCGTTACAAGGT 1200  
381 G I L E A S K Q A M F E S V A N R L Q G 400

1201 AAAATTTAGAGTGGAAAAGCAAAATGGCGGTAGAACTATTTGATAAAGGCTATGAT 1260  
401 K I L E W E K Q N G G Q N Y F D K G Y D 420

1261 TCTCGTTATGCTGCTTATTAGCTAATAACTAAAATTTGTCTGAGCTAAATAAGAG 1320  
421 S R Y A A Y L A N N L K F L S E L N K E 440

1321 TTGGAAGCTGAACGTGTTATTGCAATCACCAACAACGTTGGGATAATAATATTGGTGAG 1380  
441 L E A E R V I A I T Q Q R W D N N I G E 460

1381 TTAGCAGGTATTACCAAATTGGGTGAACGCATTAAGAGCGGAAAAGCTTATGCAGATGCT 1440  
461 L A G I T K L G E R I K S G K A Y A D A 480

1441 TTTGAAGATGGCAAGAAAGTTGAAGCTGGTCCAATATTACTTTGGATGCTAAAAGGT 1500  
481 F E D G K K V E A G S N I T L D A K T G 500

1501 ATCATAGACATTAGTAATTCAAATGGGAAAAACGCAAGCGTTGCATTCACTCGCCT 1560  
501 I I D I S N S N G K K T Q A L H F T S P 520

1561 TTGTTAACAGCAGGAACGTAAACGTGAACGTTAACTAATGGTAAACTCTTATATT 1620  
521 L L T A G T E S R E R L T N G K Y S Y I 540

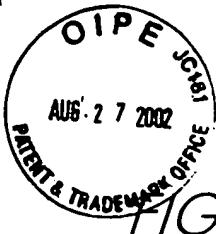
1621 AATAAGTTAAAATTGGACGTGTAACGGCAAGTTACAGATGGAGAGGCTAGTTCT 1680  
541 N K L K F G R V K N W Q V T D G E A S S 560

1681 AAATTAGATTCTCTAAAGTTATTCAAGCGTGTAGCCGAGACAGAAGGCACAGACGAGATT 1740  
561 K L D F S K V I Q R V A E T E G T D E I 580

1741 GGTCTAATAGTAAATGCAAAAGCTGGCAATGACGATATCTTGTTGGTCAAGGTAAATG 1800  
581 G L I V N A K A G N D D I F V G Q G K M 600

1801 AATATTGATGGTGGAGATGGACACGATCGTGTCTTCTATAGTAAAGACGGAGGATTGGT 1860  
601 N I D G G D G H D R V F Y S K D G G F G 620

1861 AATATTACTGTAGATGGTACGAGTGCAACAGAAGCAGGAGTTACAGTTAATCGTAAG 1920  
621 N I T V D G T S A T E A G S Y T V N R K 640



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FIG. 3-3

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1921 GTTGCTCGAGGTGATATCTACCATGAAGTTGTGAAGCGTCAAGAAACCAAGGTGGTAAA 1980  
641 V A R G D I Y H E V V K R Q E T K V G K 660

1981 CGTACTGAAACTATCCAGTATCGTATTATGAATTAAGAAAAGTTGGGTATGGTTATCAG 2040  
661 R T E T I Q Y R D Y E L R K 2 V G Y G Y Q 680

2041 TCTACCGATAATTCGAAATCAGTAGAAGAAGTAATGGTTCTCAATTAAATGATGTATTTC 2100  
681 S T D N L K S V E E V I G S Q F N D V F 700

2101 AAAGGTTCTAAATTCAACGACATATTCCATAGTGGTGAAGGTGATGATTTACTCGATGGT 2160  
701 K G S K F N D I F H S G E G D D L L D G 720

2161 GGTGCTGGTACCGACCGCTTGGTAAAGGCAACGATCGACTTCTGGAGATGAA 2220  
721 G A G D D R L F G G K G N D R L S G D E 740

2221 GGCAGATGATTTACTCGATGGCGGTTCTGGTATGATGTATTAAATGGTGGTCTGGTAAT 2280  
741 G D D L L D G G S G D D V L N G G A G N 760

2281 GATGTCTATATCTTCGAAAGGTGATGGTAATGATACTTGTACGATGGCACGGCAAT 2340  
761 D V Y I F R K G D G N D T L Y D G T G N 780

2341 GATAAATTAGCATTGCAAGATGCAAATATATCTGATATTATGATTGAACTACAAAGAG 2400  
781 D K L A F A D A N I S D I M I E R T K E 800

2401 GGTATTATAGTTAACGAAATGATCATTCAAGTAGTATTAAACATACCAAGATGGTACATA 2460  
801 G I I V K R N D H S G S I N I P R W Y I 820

2461 ACATCAAATTACAAATTATCAAAGTAATAAAACAGATCATAAAATTGAGCAACTAATT 2520  
821 T S N L Q N Y Q S N K T D H K I E Q L I 840

2521 GGTAAAGATGGTAGTTATCACTTCCGATCAAATTGATAAAATTGGCAAGATAAGAAA 2580  
841 G K D G S Y I T S D Q I D K I L Q D K K 860

2581 GATGGTACAGTAATTACATCTCAAGAATTGAAAAAGCTGCTGATGAGATAAGAGCAA 2640  
861 D G T V I T S Q E L K K L A D E N K S Q 880

2641 AAATTATCTGCTTCGGACATTGCAAGTAGCTTAATAAGCTAGTTGGTCAATGGCACTA 2700  
881 K L S A S D I A S S L N K L V G S M A L 900

2701 TTTGGTACAGCAAATAGTGTGAGTTCTAACGCCCTACAGCCAATTACACAACCAACTCAA 2760  
901 F G T A N S V S S N A L Q P I T Q P T Q 920

2761 GGAATTTGGCTCCAAGTGTAG SEQ ID NO. 1 2784  
921 G I L A P S V \* SEQ ID NO. 2 928



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MbxA	MSNIN	VIKSNIAGL	NSUKSOURNE	YIAFEK.DX	DPQKG	38
LktA	RSCHKAG	QSETOAG	SEKNTGAKK	DTENQ	DTEGG	59
ApxIIA	NGKNTTAT	RSCHKAG	SEKNTGAKK	DTENQ	DTEGG	62
H1ya	MSKETSSX	NGKNTTAT	SEKNTGAKK	DTENQ	DTEGG	61
MbxA	DEGJARLAE	EPNHTETAK	SVDIVNQFLS	TKTEKEFQKH	SINKL	103
LktA	EEGIEVORE	ERNNNTAQT	SLGNTTAIG	PQDKSA	QKA	121
ApxIIA	NDLGEVME	ERSNLDIAT	SEFDQATLG	PQDNQK	NPKT	125
H1ya	SSNDVYTA	DEGIEVYD	EKGNTATIQ	ERFETVIFA	PQDKQK	Q..KA
MbxA	AKGJ	DRKLGKSN	VSTLSSFG	TAEABIEEDS	ADPAEAKAS	104
LktA	QQA	MQNANKAK	VSGLOSSI	SWAGDDE	ALQN...N	163
ApxIIA	GNTE	ESQNTGKAN	VEGGLOSSI	SVSEVNLNE	SINCHALAKAG	180
H1ya	GENKEGSAEN	IGDNLGKAGS	VLSTFQNF	TAESSKIDE	PNGLEAKAG	185
MbxA	ETIENQSQT	QTEAASSQI	AKGSSITSOA	KFESNIEKE	INFSTIN	227
LktA	SIENJANSY	KLDEFGED	SQFSSKQNI	KSTGUEDKL	KGDMIS	245
ApxIIA	ELMENJASSY	QVDAEAOI	SKIESHQNV	KGEGGSNKL	QMDPDKAS	250
H1ya	QV.DTAASL	NNVNSQOL	NKGSVSNNT	KHENGVENKL	CNLPNDNTG	253
MbxA	GFADKNAS	GGKVAAGFE	ISNOVJENAT	KAISSEMAQ	GEETLISUL	292
LktA	AVADKNAS	FAKVGAGFE	LANDVGNIT	KAVSSYEAQ	SGATA	310
ApxIIA	GLADKEAS	TEKKAAGV	FANQJNTI	KAVSSYEAQ	PVAALFESTV	315
H1ya	SFTSNAD	ETTKVAGV	ETTKVAGV	KGISQVJAG	RAQESTSA	318
MbxA	PLAFINVAADK	ENHANALDEF	AKQERREFX	AVAALESSI	MEATS	357
LktA	PLAFINVAADK	ENHAKSLES	AERICKGD	AVAALESTV	AVAALETA	375
ApxIIA	PLAFINVAADK	ENHAKSLES	SEBEQKHD	AVAALESTV	ENIAALAS	380
H1ya	PLAFINVAADK	ENHAKSLES	SORENKHD	AVAALESTV	RISVMSVS	383

FIG. 4-1



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FIG. 4-2

MbxA	AAVGSVAKGAP	IAVGVAGVTC	ISGVIAS	NAMEEESTVANR	LOGNAMEEK	ONGCONNAMEEK	GYDSR	422
LktA	AAAGSVIAGP	IAAVGAGVTC	VISTG	NAMEEVANR	NAMEEK	NNHGKNAMEEN	SYDAR	440
ApxIIA	AAAGSVIAGP	IAAVGAGVTC	VISTG	NAMEEVANR	NAMEEK	KNKNAMEEQ	GYDSR	444
H1yA	AAATTGJAGP	VSAEVGAVTC	ISGVIAS	NAMEEVANR	NAMEEK	KGKNAMEEN	SYDAR	447
peak 23								
MbxA	YAVYVANNL	EESELENKEL	AERVIAATQ	RWDNATGEA	GIJKGERIK	SGKAYABAEF	DKRKV	487
LktA	YLANVONMK	EEINLENKEL	AERVIAATQ	QWDNNIGDA	GISRGEK	SGKAYVDAE	EGKET	505
ApxIIA	HLADLQDNMK	EEINLENKEL	AERVIAATQ	RWDNQEGDA	AISSRTDKIS	SGKAYVDAE	EGDHQ	509
H1yA	HAALIEENFK	TESQYNEKEYS	VERSVLGQ	HDTLIGEA	GYTRNGDKE	SGKSMBYVE	EGKRL	512
* 21-45								
MbxA	EAG...SNI	TEPARTIGTE	TSWSNGKKTQ	AHFTSPELT	AGTESRERLT	NGKSYENKE	KEP	548
LktA	KAD...KU	QDSSANGID	TSWSNGKAKTQ	HILFTRPLT	PGTHERERVO	TKSYENKE	NEY	566
ApxIIA	SYD...SSY	QDNNKGJIN	TSNTNR	SVERTP	BEENRERITQ	EGKSYENKE	HDR	569
H1yA	EKKPDEFQKQ	VFDPLKGND	TSSTS	LUKFTYPL	EEELIRERQ	SGKSYENKE	WGN	575
MbxA	KNEQVLD.GE	ASSSKLOESKV	ICRVA...ET	EE...IDEI	GLVINAAGN	DDIFVGOCKW	NEGGS	605
LktA	DSWVLD.GA	ASSTFOLTN	VORTGJELDN	AGNVTKKT	KRAKCEGD	DVYFSGT	EIGG	630
ApxIIA	DSWVLD.GD	ASSSVFETM	VORTAKFDD	AGNVIIESDQ	KIDANAGAN	DNVEYGSSE	YDGG	633
H1yA	DRKIVKGVQD	KGSVYEVSNL	IQHASHV	...EN.NQYREI	RJESHLGDS	DKWLSAGSA	XIYAG	634
MbxA	DGHDRYFYSK	DSEGEENETD	GTSAAFEAGSY	DIYHEWVHQ	ETKSKRTEIT	ETKSKRTEIT	EDYRD	669
LktA	EGDHRMHSR	DENNGAKTID	ATNEEFOSS	ETE	KAHENTSEH	TALGNREK	SEK	692
ApxIIA	DGHDRYHYSR	GEYGAHED	ATAEFEGCS	ETE	KAHETTAH	DINVENEKE	TEKA	695
H1yA	KGDHWMNDK	T.DTGYMTEID	GTAAEAGN	ETVQEVAKEQ	EVSGKSTER	TQYRS	TQYRS	698



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peak 26

MbxA	YELRKV.GY	YQSTDNKESV	FEVTESSQEND	VEKGSKEND	FEHSEEDDPL	DEGAGDORLE	GGKGN	733	
LktA	HSNNQH.HAG	YVTKOTL.VAV	FEETGTSITSHND	TFKGSKENDA	ENGDDGVDFT	DGNDGNDRLE	GGKGD	756	
ApxIIA	REDDRF.HTG	YVTDSEKSV	FEETGTSITSHND	FEKGSKENDV	EHGGNSVDTI	DGNDGDDHLE	GGAGD	759	
H1yA	KEFTHINGKN	YETDONLYSY	FEETGTSITSHND	FEKGSKENDA	EHGGNSVDTI	DGNDGNDRLE	GGKGN	763	
MbxA	DRESDDEGD	... . . . .	... . . . .	... . . . .	... . . . .	... . . . .	... . . . .	742	
LktA	DICDENGD	... . . . .	... . . . .	... . . . .	... . . . .	... . . . .	... . . . .	765	
ApxIIA	DWIDGCGN.	... . . . .	... . . . .	... . . . .	... . . . .	... . . . .	... . . . .	768	
H1yA	DTESGNGDB	QLYGGDGNDK	LIGGAGNNYL	NGGDGDELQ	VQGMSLAKNV	LSGGKGN	YSEG	828	
MbxA	DLDGSED	DYINGGAGND	WY1FPGDGN	DY1FPGDGN	DY1FPGDGN	DY1FPGDGN	SDIMIERTKE	GIVVK	805
LktA	BFHGGGN	DHGGKGDN	YEVHKGDN	DYVHKGDN	DYVHKGDN	DYVHKGDN	KPTEKVKHH	NEVVI	827
ApxIIA	NFVEGSGN	DHISGGKDD	DYVHKGDN	DYVHKGDN	DYVHKGDN	DYVHKGDN	KOLTEKIDS	SEEN	830
H1yA	ADLDEEGN	DYKGGYND	DYVYLSYCH	DYVYLSYCH	DYVYLSYCH	DYVYLSYCH	RDVAERREGN	DEMY	893
MbxA	RND	HSGSINPRM	YI	QNSNL	QNSNL	QNSNL	SDTSDQIBK	EDDK	859
LktA	TNS	KKEWVTONW	EREAFAKEX	PW	KETX	DE	ERISQVOD	EL..A	882
ApxIIA	TNQ	KGEKVRGAW	FEEDELASTX	AN	KATX	DR	ERISQVOD	EL..A	885
H1yA	KAEGNVLSIG	HKNGIFFKAW	FEERE..SGDI	SNHQ	..	..	ERISQVOD	EL..A	949
MbxA	KDGTVFESQE	DKKLADENKS	QSLASDIAS	SENKEVGSMA	LEGATANSIS	NAQPTQPI	QGIVIA	924	
LktA	KNGK	DKDDE	SDKLJSSIS	SDKLJSSIS	AFESNSDST	AV..VA	..MID	941	
ApxIIA	EGMNOQSEA	SDKWDNTTEL	LSK.HSKWNTTEL	LSK.HSKWNTTEL	AFESNSDST	AV..VA	..SSDFR	945	
H1yA	QSNM	ASYV	LSKAVNDNT	LSK.DRQAVNDNT	SE..GTYV.PS	..GTYV.PS	..S..ID	945	
MbxA	PSV	..	QGNLNLPLIN	ETSKTSSAEE	NEDKEERA	ASLQLSG.N	ASLQLSG.N	ASLQLSG.N	
LktA	QSLSSDQFAR	AA	..	..	..	..	..	1011	
ApxIIA	VS..ANTQYAR	AA	..	..	..	..	..	..	
H1yA	YGRAS..MFTA	SA	1023	..	..	..	..	..	

FIG. 4-3



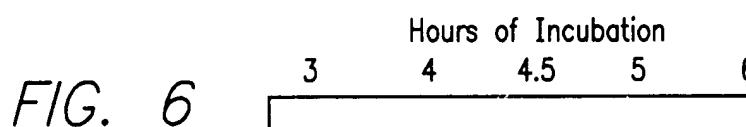
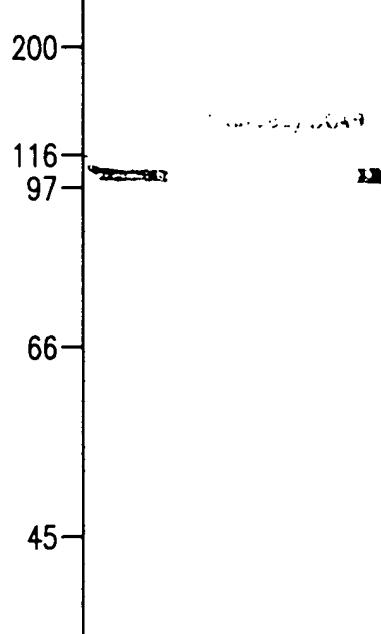
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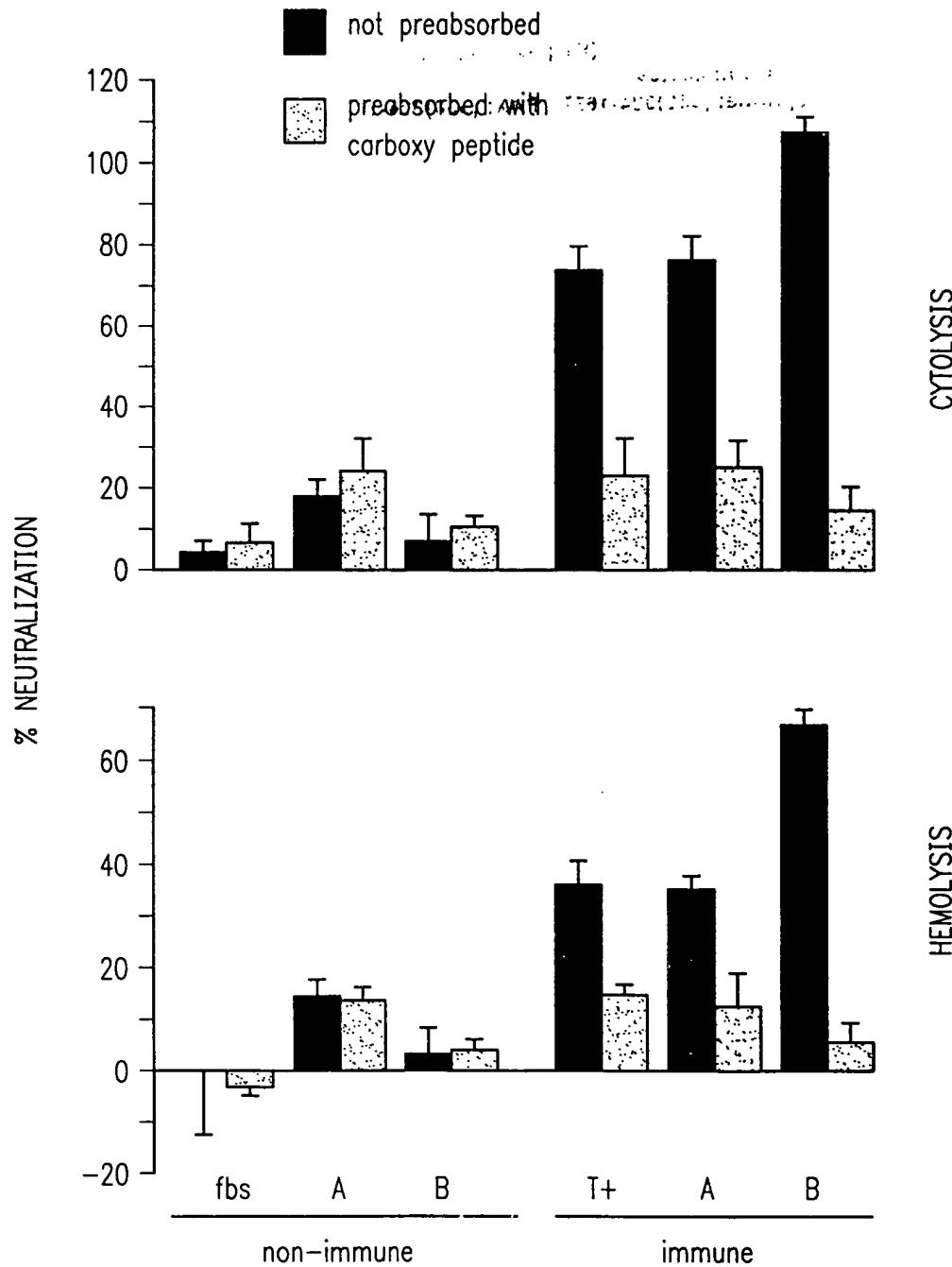


FIG. 7



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FIG. 8-1

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1 ATGGGTGGTGTACTCTTTAATTAGACTAATTACAAACCCCTAATAGTAATTAGTT 60  
1 M G G D T S L I R N L Q T L N S N L V 20  
  
61 ATGATAGATTATGCTCAACAAACCTGCTCTATCTGCTCTGGTTATCCTGCCAAATACTAT 120  
21 M I D Y A Q Q P A L S A L V I L A K Y Y 40  
  
121 GGTATTTCTGCAAGTCCAGCAGACATTATGCATCAGTTCTGATAAAACAAAAAGGAGAC 180  
41 G I S A S P A D I P M S H Q W F S T D N C T D K G D 60  
  
181 CTGAATGAAATTGAATGGATGTTGGCAGCAAAGAAATTAGAATTAAAGGTAAAGATTATA 240  
61 L N E I E W M L A A K K L E L K V K I I 80  
  
241 AACAGCCTTAACTCGATTGTCATGATAACACTTCCTGCTTGGTGTGGTGTGATAAT 300  
81 K Q P L T R L S M I T L P A L V W C D N 100  
  
301 AAGCCCGATTTAGATCAAAATTAAACTCTCATTTATACTAACTAACTAAATTGATGGGTG 360  
101 K P D L D Q N L N S H F I L T K I D G V 120  
  
361 GGATCTGCTGCAAAATATCTCATCTACGATTGATTGAGAATCGTCCCATAATATTAGAT 420  
121 G S A A K Y L I Y D L I E N R P I I L D 140  
  
421 GCAAGTGAGTTCTGAAAGATATTCTGGTAAGTTAATGCTAGTAACCTCCGTGCGTCA 480  
141 A S E F S E R Y S G K L M L V T S R A S 160  
  
481 ATATTGGGTTCATGGCTAAATTGATTTACTTGGTTATTCTGCGGTAAATCAAATAT 540  
161 I L G S L A K F D F T W F I P A V I K Y 180  
  
541 CGTTATATTTTTTGAAAGTCATCGTTATTCAGTGGTGTACAGATTTGCTCTGATT 600  
181 R Y I F F E V I V I S V V L Q I F A L I 200  
  
601 ACGCCATTGTTTTTCAGGTTGTGATGGATAAGGTATTGGTGCATCGTGGTTTCTACT 660  
201 T P L F F Q V V M D K V L V H R G F S T 220  
  
661 CTGGATGTGGTAGCGATTGCCTGGTAGTAAGTTATTGAAGTCATTTAAGTGGT 720  
221 L D V V A I A L L V V S L F E V I L S G 240  
  
721 CTACGCACTTATATTTGCTCATACAAACCTCTGAATTGATGTAGAGCTAGGAGCACGA 780  
241 L R T Y I F A H T T S R I D V E L G A R 260  
  
781 TTATTTCGTCATCTATTAGCTACCGCTTGTATTGGAGAGTAGAAGAGTAGGCGAT 840  
261 L F R H L L A L P L A Y F E S R R V G D 280  
  
841 ACAGTTGCACGTACGTGAATTGGAACATATCCGCAATTCTTAACGGTCAAGCTCTC 900  
281 T V A R I R E L E H I R N F L T G Q A L 300  
  
901 ACTTCAGTTTAGATTGGTGTCTTATATTCTTGTGTAAATGTGGTATTACAGC 960  
301 T S V L D L V F S F I F L F V M W Y Y S 320



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FIG. 8-2

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961 CCTACTTTAACACTGGTAGTTTGGCATCATTACCAATATGCGTTTGGTCTGCCTT 1020  
321 P T L T L V V L A S L P I Y A F W S A F 340

1021 ATTAGCCCAATTTACGCACTCGACTAAATGATCAATTGCACGCAATGCAGATAATCAA 1080  
341 I S P I L R T R L N D Q F A R N A D N Q 360

1081 TCTTTTTAGTGGAAAGTATTACTGCGGTTGGTACGGTAAAGCAATGGCAGTTAACCT 1140  
361 S F L V E S I T A V G T V K A M A V E P 380

1141 CAAATGACCCGTCGCTGGGATAATCAATTAGCAGCTTATGTGGTTCTAGTTTCGGGTA 1200  
381 Q M T R R W D N Q L A A Y V V V S S F R V 400

1201 GCTAAGTTGGCAATGGTTGGCAGCAAGGAGTACAACTCATTCAAAGATGGTTATTGTG 1260  
401 A K L A M V G Q Q G V Q L I Q K M V I V 420

1261 GCAACTCTATGGATTGGTGCAGGAAATTGTAATTGAAGGCAAGCTATCGTAGGTCAATT 1320  
421 A T L W I G A K L V I E G K L S V G Q L 440

1321 ATAGCATTAAATATGCTGGCAGGTCAAGGTGGCCGCTCCTGTTATCCGCCTGGCACAGCTA 1380  
441 I A F N M L A G Q A A P V I R L A Q L 460

1381 TGGCAAGATTTCAGCAAGTAGGTATTCAGTGGCGAGATTGGGTGATATTTAAACT 1440  
461 W Q D F Q Q V G I S V A R L G D I L N T 480

1441 CCAACTGAGCATTCTACATCTCGCTTAACCTTACCTGATATTAAGGGTGATATTACATT 1500  
481 P T E H S T S R L T L P D I K G D I T F 500

1501 GAAAATGTGATTTCGCTACAAATAGATGGCATTAAATATTACAGAATTAAATT 1560  
501 E N V D F R Y K I D G H L I L Q N L N L 520

1561 CAGATTAACGCTGGAGAGATACTAGGTATCGTAGGACGCTCTGGTTCAAGTAAATCAACA 1620  
521 Q I N A G E I L G I V G R S G S G K S T 540

1621 TTGACAAAATTAGTACAGCGTTATGTACCAAGAAAATGGCGAATATTAGTTGATGGA 1680  
541 L T K L V Q R L Y V P E N G R I L V D G 560

1681 AACGATTTGGCATTAGCTGATCCGCTGGCTCGCGCCAAGTGGGTGTTGGCAG 1740  
561 N D L A L A D P A W L R R Q V G V V L Q 580

1741 GAAAATGTGTTACTCAATCGTAGTATTCAGAGATAATATTGCCCTAACTGATAACGGGCATG 1800  
581 E N V L L N R S I R D N I A L T D T G M 600

1801 TCATTAGAGTTTATTATCCAGGCTGCCAAGATGTCTGGGGCACATGACTTTATTATGGAA 1860  
601 S L E F I I Q A A K M S G A H D F I M E 620

1861 TTGCCTGAGGGTTATGATACGATTGGAGAGCAAGGTGCAAGGCTGTCAGGTGGACAA 1920  
621 L P E G Y D T I V G E Q G A G L S G G Q 640



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1921 CGCCAGCGTATCGCTATTGCGCGTGTAAATTACCAATCCGCGTATTTGATTTGAT 1980  
641 R Q R I A I A R A L I T N P R I L I F D 660

1981 GAAGCTACTAGTCATTAGACTATGAGTCGGAAAGGGCTATTATGCAAAATATGCAGGCA 2040  
661 E A T S A L D Y E S E R A X M Q N M Q A 680

2041 ATTTGCCAAGGTAGAACAGTGTGATTATTGCACATCGCTTATCTACCGTAAAAATGGCA 2100  
681 I C Q G R T V L I I A H R L S T V K M A 700

2101 CATCGCATTATTGCAATGGACAAGGGAAAATTGTAGAGCAAGGCACACATCAAGAATTG 2160  
701 H R I I A M D K G K I V E Q G T H Q E L 720

2161 TTGCAAAAAGAAGATGGTTACTATCGTTATTATGATTTGCAGAATGGATAAA 2215  
721 L Q K E D G Y Y R Y L Y D L Q N G \*

FIG. 8-3



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FIG. 9-1



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MbxB	QMTTWDQ	LAIVVSSE	RYAKLAMIG	QQGYQQLQX	MINIMATEW	GAKEVIEGK	LSVWQJ	421
LktB	QMTDTWDQ	LAIVVSSH	RYAKLATE	QQGYQQLQX	MINIMATEW	GAHVIEGK	LS1601	412
ApxB	QMTNTWDQ	LAIVVSSA	RYAKLATE	QQGYQQLQX	MINIMATEW	GAHVIEGK	LS1601	411
H1yB	QMTNTWDQ	LAIVVAAQ	RYAKLATE	QQGYQQLQX	MINIMATEW	GAHVIEGK	LS1601	411
MbxB	AFNMLAGQ	LAIVVIREAQ	LYQDFQDQV	SVARLGDJ	NUTPIEHST	SRETEPLDK	GB1615EN	482
LktB	AFNMISQY	LAIVVIREAQ	LYQDFQDQV	SVARLGDJ	NUTPIEHST	SRETEPLDK	GB1615EN	473
ApxB	AFNMISQY	LAIVVIREAQ	LYQDFQDQV	SVARLGDJ	NUTPIEHST	SRETEPLDK	GB1615EN	472
H1yB	AFNMLAGQ	LAIVVIREAQ	LYQDFQDQV	SVARLGDJ	NUTPIEHST	SRETEPLDK	GB1615EN	472
MbxB	YDFRYKIDG	HLIILQUNL	QINAGEILG	IVGRSGSGK	SUTXEVOR	LYMPENGRI	IVDEGNDL	543
LktB	YDFRYKPA	HLIILQUNL	QINAGEILG	IVGRSGSGK	SUTXEVOR	LYMPENGRI	IVDEGNDL	534
ApxB	YDFRYKPA	HLIILQUNL	QINAGEILG	IVGRSGSGK	SUTXEVOR	LYMPENGRI	IVDEGNDL	533
H1yB	YDFRYKPA	HLIILQUNL	QINAGEILG	IVGRSGSGK	SUTXEVOR	LYMPENGRI	IVDEGNDL	533
MbxB	ALADPWR	ROGVYQLE	NWELNRST	DNUALTEIS	ASHEF110A	AMISGAHDF	IVMEPEG	604
LktB	ALADPWR	ROGVYQLE	NWELNRST	DNUALTEIS	ASHEF110A	AMISGAHDF	IVMEPEG	604
ApxB	ALADPWR	ROGVYQLE	NWELNRST	DNUALTEIS	ASHEF110A	AMISGAHDF	IVMEPEG	604
H1yB	ALADPWR	ROGVYQLE	NWELNRST	DNUALTEIS	ASHEF110A	AMISGAHDF	IVMEPEG	604
MbxB	YDTIVQEG	AGLSSGQR	RIATARAII	TINRHIQII	FAISALDYE	SEH1NRMV	QAI1QSR	665
LktB	YDTIVQEG	AGLSSGQR	RIATARAII	TINRHIQII	FAISALDYE	SEH1NRMV	QAI1QSR	665
ApxB	YDTIVQEG	AGLSSGQR	RIATARAII	TINRHIQII	FAISALDYE	SEH1NRMV	QAI1QSR	665
H1yB	YDTIVQEG	AGLSSGQR	RIATARAII	TINRHIQII	FAISALDYE	SEH1NRMV	QAI1QSR	665
MbxB	YVLLAIRE	STVCKAHE	YANDKKEY	EDQJHQEII	EDKEDAYTR	EDD1QNL	EDD1QNL	717
LktB	YVLLAIRE	STVCKAHE	YANDKKEY	EDQJHQEII	EDKEDAYTR	EDD1QNL	EDD1QNL	708
ApxB	YVLLAIRE	STVCKAHE	YANDKKEY	EDQJHQEII	EDKEDAYTR	EDD1QNL	EDD1QNL	707
H1yB	YVLLAIRE	STVCKAHE	YANDKKEY	EDQJHQEII	EDKEDAYTR	EDD1QNL	EDD1QNL	707

FIG. 9-2



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FIG. 10

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1	ATGACGAAAAAGTTGCAGAGCTAGGTTAATTGCATGGCTTGGCTAACTCTGATATG	60
1	M T K K F A E L G L I A W L W S N S D M	20
61	CATAAACATTGGACGTTGTCTTGTGCGACCAATGTTATTCCGGCAATTGAGACAGGT	120
21	H K H W T L S L F A T N V T P A I E T G	40
121	CAATATGTTATATTGAAAAGAGAAGATATGCTGTAGCATATTGTTAGTGGGCTAAACTT	180
41	Q Y V I L K R E D M P V A Y C S W A K L	60
181	AGTTTAGAAAACGAGGTTAAATATTAACGATGTTACTCTCTTAAGTTAGATGACTGG	240
61	S L E N E V K Y I N D V T S L K L D D W	80
241	CAGTCAGGTGACCGAAACTGGTTATTGACTGGATTGCTCCATTGGCGATAGTCTTACA	300
81	Q S G D R N W F I D W I A P F G D S L T	100
301	CTCACAAAACACATGAGAACGTTATTCAGATGAATTGTTAGAGCGATTGTTAGAT	360
101	L T K H M R T L F S D E L F R A I R V D	120
361	GGAAATTCAATCGCATGGTAAGATATCTGAATTGAAAGTCTGTTGATTCAAAATTA	420
121	G N S S H G K I S E F Y G K S V D S K L	140
421	GCCTCAAGAATATTCACAATATCACGAAGATTGACGAGCAAATTGTCACTCAGAAT	480
141	A S R I F A Q Y H E D L T S K L S T Q N	160
481	AATTTTATTATATCTAAAGATAATTAA	507
161	N F I I S K D N *	169



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MbxC	---MTKFAE	GLIAWLSN	SDMKHNTS	FTATVIBA	FTCGY	42
LktC	--MNOQSYNL	LSNTHJMN	SSLEKERSCE	FTARNTPAT	ENEDY	43
ApXIC	MSKKINGEEN	GEVARWAS	SPYRKPS	FTATNTPAT	ESNOT	45
H1yc	-MNRNAPLEN	IGHVSQELAS	SPLRNPPVS	FTFRNTPAT	RANQY	44
MbxC	WILKREDMV	AYCSWANSH	ENEVKINDY	FTSKLDQAS	SDANW	87
LktC	MLIDONGIRI	AYCSWADNE	FTENKIKDI	NEATPEENQ	CDRRA	88
ApXIC	WILKRDFFRI	AYCSWANDNE	FTENKILDDY	AS-VAADDNTS	CDRRA	90
H1yc	ALLTRDNYV	AYCSWANSH	FTENKILDDY	FTSKNEANT	CDRKA	89
MbxC	FIDWTAPEGD	SLTUKHMT	FTSFELTAT	FTUGNSS.HG	KNSE	131
LktC	FTDWAPEGD	SOLLYKNCQ	FTBOMWMSI	FTFYXQKELG	AYAE	133
ApXIC	FIDWTAPEGD	SALYKHM	FTNEFRA	FTFDPSR.VG	KISEE	134
H1yc	FIDWTAPEGD	NGALLYKMK	FTFDEFLRQ	FTDORKTH.VG	KISEE	133
MbxC	YOKSVDISKIA	TSKADYED	FTSKESTON	FTISKDN	168	
LktC	KGSKZDJKTA	FTKRDYQEE	FTAKAEEF	FTKK---	167	
ApXIC	KGSKZDJKTA	FTKRDYQEE	FTMSKOKQ	FTKESVNS	172	
H1yc	KGSKZDJKTA	FTKRDYQEE	FTTENKHE	FTENKSD	FTTG-	170

FIG. 11



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FIG. 12-1

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1 ATGTTTATAACAAGCACTAAAGATTTTTTATTGCTATATAACCGTTGGCGCAATACA 60  
1 M F I Q A L K D F I R Y I T V W R N T  
  
61 TGGGCAGTTGAGACCAACTAACCCCTCTAACCGTACTAAAGAAGAACTCGCTTTCTT 120  
21 W A V R D Q L T P P K R T K E E L A F L 40  
  
121 CCTGCACATCTAGAACTCACTGACACACCTGTATCCAGATCTTCTAAAGTGGACAGCTAGA 180  
41 P A H L E L T D T P V S R S S K W T A R 60  
  
181 ATAATCATGATATTGCTCTATTGCTTGGCTATGGCTTGGGTTGGACAGATTGACATT 240  
61 I I M I F V L F A L L W S W V G Q I D I 80  
  
241 GTTGCTACAGCTTCAGGTAAAATTCTTCAGGTAGCCGTAGCAAGACTATTCAATCTTG 300  
81 V A T A S G K I S S G S R S K T I Q S L 100  
  
301 GAAACAGCGATAGTTAAAGCAGTTATGTACGTATGGTCAAAATGTTCAACAAGGTGAA 360  
101 E T A I V K A V Y V R D G Q N V Q Q G E 120  
  
361 ATATTAGTAGATTTAGTGGGAATCGGTTAGATAGTGTACGTGCTCAGTCCGAGAAAGCC 420  
121 I L V D L V G I G S D S D V A Q S E K A 140  
  
421 CTTCGAGCAGCGCAATTATCTAACGCTACGCCCTGAAGCAATTTCAGCATTAAATCAC 480  
141 L R A A Q L S K L R L E A I L S A L N H 160  
  
481 CGTATTAAATCCTCAGATTGATGTAGCATATGCAAAGTCTTAAATATTCAGAATCGGAA 540  
161 R I N P Q I D V A Y A K S L N I S E S E 180  
  
541 ATTAATGAAGCTAAACTTAGCCAAAATCAATATCAAGCATGGTAGCACAAGATGAA 600  
181 I N E A Q T L A Q N Q Y Q A W L A Q D E 200  
  
601 CAACTAAAATTAACCTAAAAGGACATCAAGCAGAATTACAATCTGCTCGATCCCAAGAA 660  
201 Q L K L T L K G H Q A E L Q S A R S Q E 220  
  
661 CAAAAGTTGGTTCAAGTTGGTCAATTGAAACATCAAAAGACTGATGATTATCGGAGTCTC 720  
221 Q K L V S V G A I E H Q K T D D Y R S L 240  
  
721 AAAGCAGAAAATTATCTGAGCATGCTTATCTAGAACAGAAAGCAAATTACTTAGC 780  
241 K A E N F I S E H A Y L E Q E S K L L S 260  
  
781 AATCAAAATGATTACAAAGTACACGTAGTCAGATTCAAAAATACAGGCTGCAATCATG 840  
261 N Q N D L Q S T R S Q I Q K I Q A A I M 280  
  
841 CAAGCTGAACAGAACCGTATGTTATACTCAAAATCTAAAACGTGATACATTAGAATCT 900  
281 Q A E Q N R M L Y T Q N L K R D T L E S 300  
  
901 TTACGCCAACCAATGAACAGATTAATCAATATCTGGTCAAACTAATAAGCTAACAG 960  
301 L R Q T N E Q I N Q Y T G Q T N K A K Q 320



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FIG. 12-2

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961 CGACAGAAATTGCTGAGTATTAATCACCTGTTAATGGTACTATACAAGAGCTAACAGCT 1020  
321 R Q K L L S I K S P V N G T I Q E L T A 340

1021 TATACTTTAGGTGGAGTTGTACAAGCAGCACAAAAATTATGGTTGTGGCACCTAACGAT 1080  
341 Y T L G G V V Q A A Q K I M A V V A P N D 360

1081 AATCAAGTGGAAAGTAGAGGTATTAGTGCTAAATAAGATATCGGCTTGTAAAAGCTGGG 1140  
361 N Q V E V E V L V L N K D I G F V K A G 380

1141 CAGAATGTTATCATCAAAATCGAGAGTTTCCTTACACGTTATGGTTATTTAACAGGT 1200  
381 Q N V I I K I E S F P Y T R Y G Y L T G 400

1201 AAAATAAAAAGTATTAGTCATGATGCTATAGAACATCAACATTAGGTCTAGTGTATACT 1260  
401 K I K S I S H D A I E H Q H L G L V Y T 420

1261 GCACTTGTTCTTGATAAAAGCACATTAAATATAGATGGAGTAACAATCAACTAACG 1320  
421 A L V S L D K S T L N I D G V T I N L T 440

1321 CCAGGAATGAATGTTACTGCTGAAATTAAAACAGGTAAACGTCGTGTTGGATTATATA 1380  
441 P G M N V T A E I T G K R R V L D Y I 461

1381 TTAAGTCCATTGCAGACAAAAGTTGATGAAAGTTTCGAGAACGCTAA 1428  
461 L S P L Q T K V D E S F R E R \* 476



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FIG. 13-1

MbxD	~MF1QALD	FURVIIW	NEMANRQGET	PPKRTKEELA	ELPAHLELQD	48
LktD	AKJLNSGFE	FEERYKNIWA	EWIKERKEED	HPIRKDSE	ELPAHLELSE	50
ApxID	MKTWNGYHE	FEQRYKTVI	EJWIKERKEED	HPIREKDENE	ELPAHLELSE	50
H1yD	MKTINMGFSE	FEERYKUWS	EJWIKERKEID	HPIREKDENE	ELPAHLELSE	50
MbxD	TPVSRSSKWT	ARTIMMIAVLF	ELWISWVQGT	IVATASGQI	SSGSRSKTRIO	98
LktD	TPVSKRPREI	AXLIMLEFLV	ALWASVSKV	EIVATAPKEI	TFSGRSKTRIK	100
ApxID	TPVSKKPREI	AXLIMLEFL	ALVISWSHV	EIVATATGK	AESDRSKTRIK	100
H1yD	TPVSRPREV	ANLIMGELV	ALFLSYLGQV	EIVATANGK	TFSGRSKTRIK	100
MbxD	SIEFTIAHRAV	YMPDCCQNYQO	CEIUVDIVGJ	GSOSDVAOSE	KATRAQESK	148
LktD	PTEANAVQEF	FVKDQEVEN	GOLHVSAT	GSADIKKTM	ASESTEAKEN	150
ApxID	PTEANALVQEF	FVQDGEVEK	DQELHFEAL	GAAPQQKIK	SSLSLTKER	150
H1yD	STENSIYKEI	INREGESVRS	GDVELKETAL	GAEADTLKQ	SSSLQARLQ	150
MbxD	LNLEAITSAL	NHRINQDQY	AYAKSLNIS	EESEINEAQTE	AQNOYQATLA	197
LktD	TRYOTLTAI	EKESEFVDI	:SRTEEKDS	EEDRERIKH	EEQYTTWOK	199
ApxID	TRYEELEJAN	AADREPLIE	.TKDEEKHAT	EEDKTRYRY	ETEEFEAWOK	199
H1yD	TRIQEISRSI	ELNKJFELK	PDEPYEQNS	EEEVERITSE	EEQFSTWGN	200
MbxD	QDEQKLTEK	GHQAEFLDSAR	SOEQRLVSYG	AIEHOKTDY	RSKEAENFES	247
LktD	QXTOKEAYK	RKEAEROTIF	AYVTKZEGAT	RLEQKEKOL	KATYQKESLS	249
ApxID	QXTOKEALQ	RKEAEROTIF	ANERGEGIS	RLENEREKOL	KKFNSKSLS	249
H1yD	QXTOKEJND	RKEAEROTIF	ARENENVS	RLEKSRDQD	RSJLHKQAFIA	250
MbxD	EBYFEQESK	UUSNGNDQOS	TRSOJOKTA	AYNGAEONRM	CYTQNRKDT	297
LktD	YNEUJAGENK	LIETQNAWAV	DRSKNEN	DLINVKELLE	ETIGFEKSDM	299
ApxID	KDQVJNQNR	HEEMANERY	DRSKNEN	DLRAKEBH	ETIGFEKTRAD	299
H1yD	KHAWLZENK	YVEMANERY	DRSKNEN	DRSKNEN	ETIGFEKTRAD	300



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FIG. 13-2

MbxD	ESEROTNEQ	INOMEGOTNIK	AKQDQKULLS	ETAVT	EGVM	347
LktD	LEK	EROTREEEK	NROROASM	ETHTT	GGV	349
ApxID	KOHEN	EKO SSEEK	NEOROASY	ETHT	VGGW	349
H1yD	DKERQTD	IEELLEEK	NEEROASY	ETHT	GGV	350
MbxD	QAEQKIMWVA	PNDNOVEEV	TKDGEV	ESFPYTRYG	397	
LktD	TTAE	PEDDWHEATA	ENPKDGEV	ETFPYTRYG	399	
ApxID	TTAE	PEDDWHEATA	TKDGEV	ETFPYTRYG	399	
H1yD	TTAE	PEDDWHEATA	TKDGEV	ETFPYTRYG	400	
MbxD	TGKXSESH	DATDQHED	STEIN	INIPGMNT	446	
LktD	TGKXHISP	DATDQPNWQ	IDAVT	KNITS PDSRK	449	
ApxID	MSKXKNTT	DATDQPNWQ	VENN	DCESENT TS	449	
H1yD	LVGSKVANL	DATDQPNWQ	VENN	ETLSG KOGKE	449	
MbxD	AETXKXKRM	DDVILSPQT	KIDDEFRE	FEIGCMS V	449	
LktD	AETXKXERS	MSXLLSPQT	SYSFSEER	IPESGMAK	449	
ApxID	AETXKXERS	MSXLLSPQT	SYSFSEER	IPESGMAK	449	
H1yD	AETXKXERS	MSXLLSPQT	SYSFSEER	IPESGMAK	449	

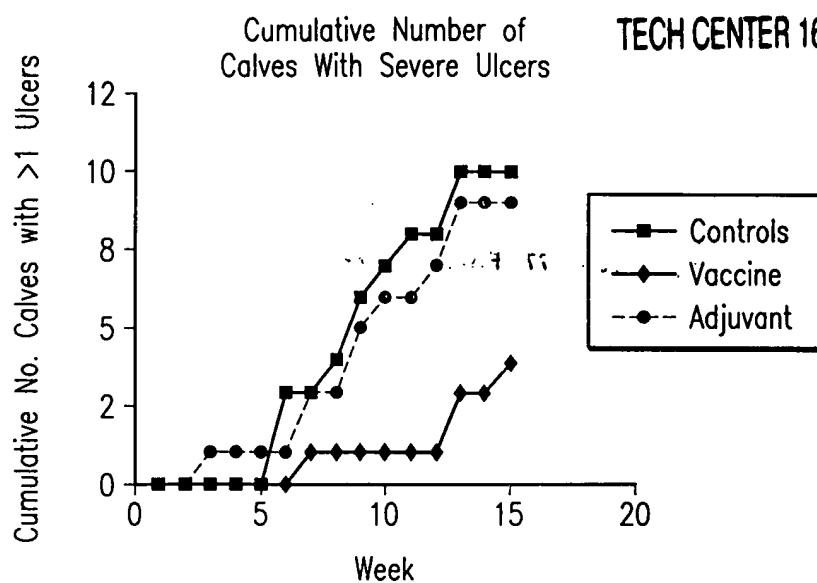


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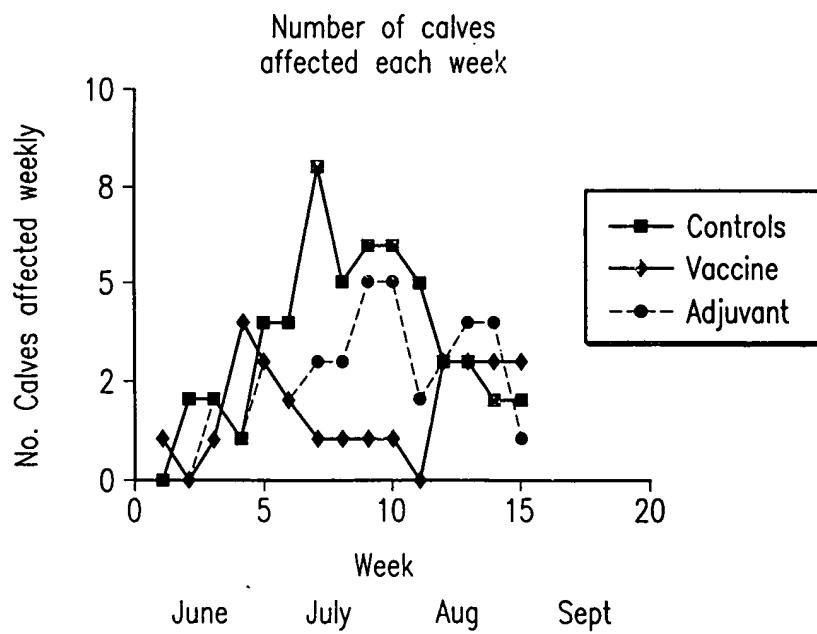
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Number of calves with ulcers with clinical scores >+2

FIG. 14



Number of calves affected weekly in 1 group of vaccinated calves and in controls.

FIG. 15



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- ADJ group
- ▲ CTRL group
- ◆ VAC group

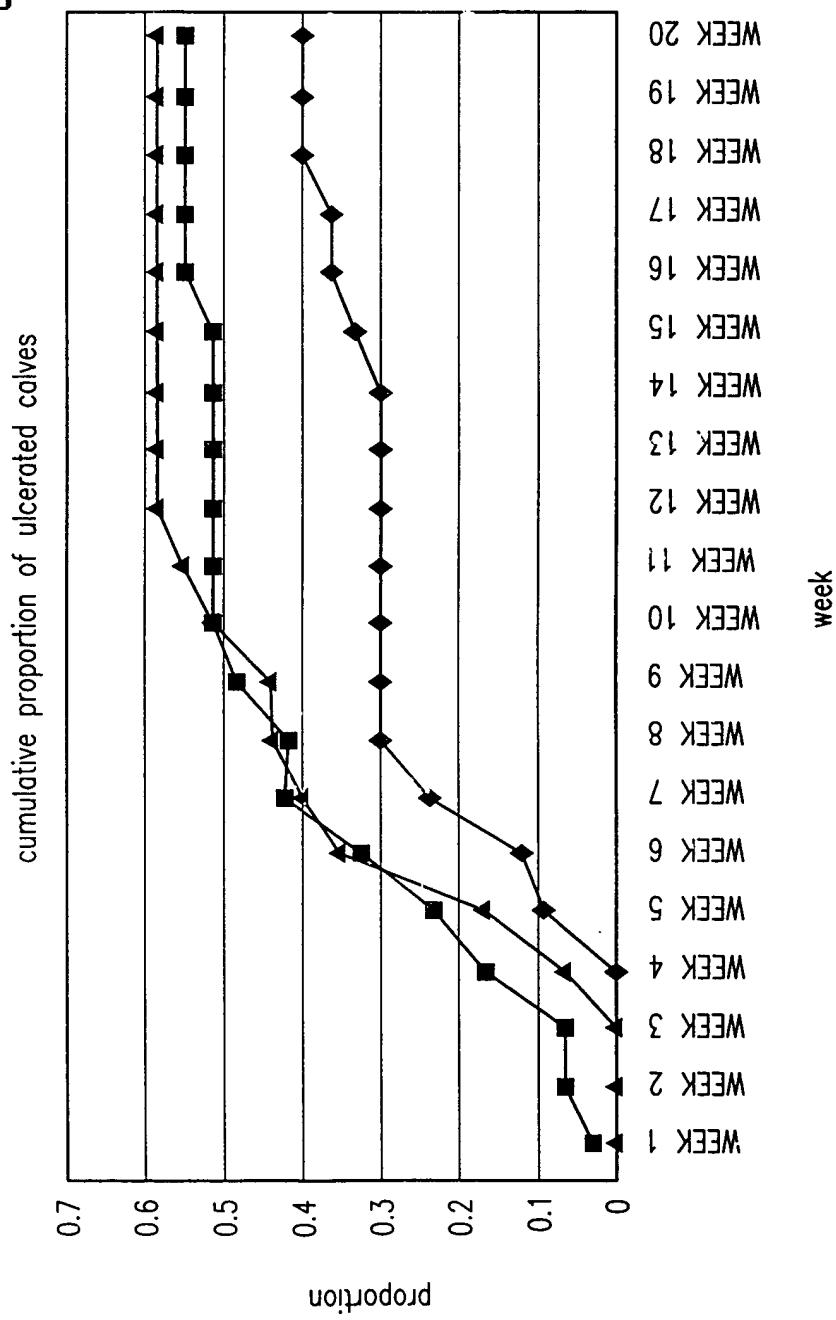


FIG. 16

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